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ABSTRACT

Students in an introductory textiles course at the University of Nebraska's College of Home Economics actively participate in the learning experience through a self-paced instructional technique. Specific learning packets were developed adapting programmed instructional learning materials to computer assisted instruction (CAI). A study booklet contains both the programmed instructional material and directions for interacting with the computer. Following reading on a specific topic, questions are presented using the computer system. Currently eight programmed lessons are available concerning textile terminology, yarns, simple and plain weaves, care labeling, textile legislation, and flammability legislation. Student exposure to computer technology is an additional advantage of this method, particularly for the merchandising/retailing majors who comprise half the departments' student population. Students have expressed positive reactions toward CAI, which have been reflected in their course grades.
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Computer - Assisted Programmed Instruction in Textiles

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"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

The class meets for lecture at 9:00 a.m. on Mondays and Wednesdays in a windowless 200 seat auditorium. All building heat is off for the weekend. On Monday morning, the average room temperature of 58° keeps them awake, and on Wednesdays, the limited air flow in a superheated 86° excuses the Tuesday night basketball crowd to doze. The lecture covers physical, biological and chemical properties of polyester and olefin textile fiber. Two-thirds of the students have had neither high school nor college chemistry. Winter's effects are observed. Several absences are noted, and among those present, the physical effect of various winter ailments linger. An exam is fast approaching. The professor is one class behind the course schedule, and so delivers today's lecture in double-time.

A scenerio from a quarter of a century ago? No. A very apt description of the learning environment often present in the classroom of our most distinguished colleagues. In fact, the class herein described is TCD 206, Introduction to Textiles. Today's student, the adult of the "me" generation childhood, assigns responsibility in the way in which he or she has learned. It is important to remember that todays college student is the product of the "no home work" rules in elementary school, and of experimental smorgasboard sampling of high school curriculum.

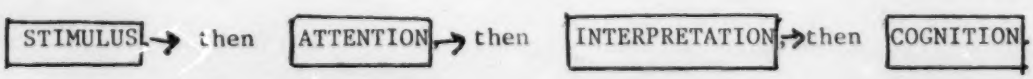
But education is not a process of teaching, it is a process of learning. And, an individual's attitude toward behavior, in this instance the educative process, is dependent upon the composition of his or her cognitions, that is, the sum total of previous experiences, and learned respons patterns in the educative setting.

Knowles (1978) in discussing andragogy has stipulated that the most fruitful learning environments exist when the learners accept a share of the responsibility for planning and operating a learning experience, and therefore, have a feeling of commitment for learning. Furthermore, when learners can actively participate in the learning process, can diagnose their own needs, and experience immediate feedback about a sense of progress toward their goals, then learning is optimized.

Furthermore, recent advances in the theoretical constructs of cognitive styles help the educator to know that in any classroom one encounters in perceptive students and the receptive students, the field dependent individuals and the field independent individuals, the Level I learner and the Level II learner. Cognitive style theoreticians would remind us that there are not good students and bad students, good teachers and bad teachers, but that the changing student bodies among our open admission, equal opportunity enrollments demand more attention to more skilled methods of teaching.

Therefore with full cognizance of underlying learning theory, and with an acknowledged problem of a less than optimism learning environment, and a limited experimental knowledge of the learner about how to learn, we at the College of Home Economics, University of Nebraska, recognized a problem, and sought a solution.

How to begin was with an understanding of the perception process. The simplified model presented by Asker and Meyers (1975) will serve us well:



The learner screens stimuli, attends to them at some level, interpretes them in some manner, and establishes some level of cognition. These cognitions, in turn, become part of a learner's memory bank through the process of learning.

So we sought learning strategies which would build on the process of perception; and be adaptable to our knowledge of cognitive learning style. Programmed or student-paced instruction was seen as appropriate, considering the learning style of the teacher. But recognizing that one of the limitations of self paced instruction is its appeal for the Level I, receptive or field dependent learner and its dogmatic approach which would be judged boring or non challenging or lacking in appeal to the Level II, perceptive or field independent learner, we immediately considered interactive computer software as the tool for optimizing the learning environment for all.

One hidden advantage to computer-assisted self-paced programmed instruction in this department is that approximately one half of our students are merchandising/retailing majors. These students will use the computer as an everyday tool during most of their professional careers, and their success in maximizing this tool will probably be proportional to their attitudes toward computeres. This we saw this as an opportunity to develop psoitive experiences and thus positive attitudes towards computers early in their college careers.

There were two simultaneous beginnings to our CAI - Programmed instruction: a) development of the programmed instruction learning modules and b) development of the computer software. Let's begin with the second first.

The University of Nebraska has encouraged incorporating of modern teaching techniques in the classroom, particularly those which utilize the computer facilities. The University currently has several groups of IBM 2741 remote computer terminals located in selected buildings on the UNL campus. By using regular telephone lines and special data sets, students can access the Conversational Monitor System (CMS) which runs on an IBM 370 computer housed in the State Capitol Building in Lincoln. The fast response of the CMS provides the means for implementing conversations between the student and the computer.

Ineractive software programs developed to capitalize on CMS potential include Fortran porgrams of multiple choice format and fill in the blank format. "Choice" is a program which presents the student with a series of multiple choice questions and appropriate responses to incorrect and correct answers. An advantage of using a multiple choice question technique is that it provides positive reinforcement and immediate feedback by automatically scoring the answer. It also responds with appropriate information explaining why the choice was correct or incorrect. The "Choice" program is quite flexible as it provides from two to nine multiple choice answers. The range of questions is limited to twenty. A program of 20 questions will take the student twenty to thirty minutes to complete. After this length of time, the experience becomes tedious. Limiting the range of questions also prevents the computer terminals from being tied up for an excessive time period.

Another program format which is available is "Blank." This is a program designed for fill-in-the-blank questions. This program places emphasis on vocabulary and spelling. Because the program is particular in reference to spelling and punctuation, the student can be provided

with a list of vocabulary words from which to choose. The computer will recognize these words as the appropriate responses. It is estimated that it takes students one minute to respond to a question. Therefore, because of fatigue and computer use, it is suggested the range of questions within a packet not exceed thirty.

Development and Use of Learning Packets

The Textiles, Clotining and Design department in the College of Home Economics is currently using the CMS in a programmed learning situation in the Fashion Merchandising and Textile Science areas.

Learning packets were developed in 1975 to supplement the Introductory Textiles course. Students check out the booklet, "TCD 206 - TEXTILES COMPUTER-ASSISTED PROGRAMMED INSTRUCTION MANUAL," from the library which contains programmed instruction and directions to interact with the computer. The students are directed to read the first part of the lesson and to respond to questions presented to them by the computer. The booklet follows a programmed sequence of instructions unique to each unit of subject matter presented.

These programs implement the two formats either "Choice" using multiple - choice questions or "Blank" format for presenting fill-in-the-blank questions.

Here is an example from the learning experience blank legislat, Legislation. First, the student reads this introductory paragraph:

> "The first laws concnerning textile products were those concerned with trade practices. Present legislation is concerned not only with fair trade practices, but also with protecting the safety of the consumer. Textile legislation is important because it effects everyone. The following is a brief summary of the textile legislative action.
> 1. Wool Products Labeling Act of 1939 (WPL)
> At this time rayon and acetate were the only man-made fibers which could be blended with wool to give a wool-like appearance. Products of these blends were often labeled as wool. Complaints against this false information were brought

by wool proudcers, manufacturers and some consumer groups.
The purpose of the WPL was to protect producers, manufacturers, distributors and consumers from the unrevealed presence of substitute fibers or mixtures in spun, woven, knitted or otherwise manufactured wool products."

Then the learner is directed:

NOW, GO TO THE COMPUTER AND ANSWER QUESTIONS 1-4.

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"QUESTION  1
THE FIRST LAWS CONCERNING TEXTILE PRODUCE IS WERE THOSE CONCERNED WITH
_____.

TYPE THE ANSWER AND HIT RETURN.
.trade practices
NO MAE BRUNKEN                  THAT'S NOT IT.  TRY AGAIN

TYPE THE ANSWER AND HIT RETURN.
.everyone
NO MAE BRUNKEN                  THE ANSWER  SHOULD BE TRADE PRACTICES

QUESTION  2
TEXTILE LEGISLATION IS IMPORTANT, AS IT EFFECTS _____.

TYPE THE ANSWER AND HIT RETURN.
.everyone
YES MAE BRUNKEN                 YOU'RE  RIGHT

QUESTION  3
BEFORE WW1, TWO MAN MADE FIBERS BLENDED WITH WOOL TO GIVE A WOOL LIKE
APPEARANCE WERE _____  _____.

TYPE THE ANSWER AND HIT REUTRN.
.rayon and acetate
YES MAE BRUNKEN                 YOU'RE  RIGHT

QUESTION  4
PRODUCTS OF THESE RAYON/WOOL, OR ACETATE/WOOL BLENDS WERE OFTER MIS-
LABELED AS _____/

TYPE THE ANSWERE AND HIT RETURN.
.wool
YES MAE BRUNKEN                 YOU'RE RIGHT."
```

Notice that our program enables the student to be recognized by name, which has proven to be very important for reinforcing positive attidues toward computers. But notice that students also develop some very elementary understanding of how computers function. Our student,

Mae, learned through actual experience the principle discussed earlier in the semester, that the program "worked" by the computer matching letters and digits, and that errors in typing orspelling would be scored incorrect. Notice that after two attempts, the computer is programmed to provide the correct answer.

With the multiple choice format the learner also has two opportunities to answer the question. The "Choice" program congratulates the student for a correct answer and provides a reason why the response is inappropriate for an incorrect answer.

"QUESTION 18

TWO CHARACTERISTICS OF THE BASKET WEAVE ARE

1. FLEXIBILITY: WRINKLE RESISTANCE

2. ABSORBENCY: FLOATS WHICH MAY SNAG

3. WRINKLE RESISTANCE, STRENGTH

TYPE THE NUMBER OF THE ANSWER AND HIT RETURN.

.2

NO, THAT'S NOT IT.

ALTHOUGH THE FLOATS MAY SNAG IN A BASKET WEAVE, ABSORBENCY IS NOT CHARACTERISTIC OF THE BASKET WEAVE.

DO YOU WANT TO TRY ANOTHER ANSWER? YES OR NO?
.YES

TYPE THE NUMBER OF THE ANSWER AND HIT RETURN.
.1

YES, YOU'RE RIGHT!

FLEXIBILITY AND WRINKLE RESISTANCE ARE CHARACTERISTICS FO THE BASKET WEAVE."

At the completion of the learning experience, the number attempted is determined, and a score computed and reported to the student, along with a message of encouragement or congratulations.

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"TYPE THE ANSWER AND HIT RETURN.
.fiber content
NO MAE BRUNKEN              THAT'S NOT IT.  TRY AGAIN

TYPE THE ANSWER AND HIT RETURN.
.percentage
YES MAE BRUNKEN             YOU'RE RIGHT
MAE BRUNKEN
YOU TRIED 28 QUESTIONS AND GOT 24 RIGHT ON THE FIRST TRY.
THAT GIVE YOU A SCORE OF 85.71%
GOOD WORK
THE COMPUTER IS RECORDING YOUR SCORE.
PLEASE WAIT FOR THE R;
R;

.logoff

LOGOFF AT 11:25:26 CST TUESDAY  12/09/80.
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Over the time we have used these programs, we have developed several accessory software programs. Each student has his or her own account, and the computer records each student's logons, and dollars used. An additional software feature monitors each of the 8 lessons, recording all students who requested those lessons, and how far through the lesson the student progressed, and on what date. This feature has made excuses of work left at home no longer applicable!

We have 8 lessons available for the Textiles students. These lessons include:

Title	Topic
blank introtex	Introduction to Textiles,
choice spunyarn	Yarns Lesson 1,
blank filament	Yarns Lesson 2,
choice plainwea	Plain Weaves,
blank weaves	Twill and Satin Weaves,
blank labeling	Permanent Care Labeling,
blank legislat	Legislation Affecting Textils+
blank flegis	Flammability Legislation.

For some of the lessons, the programmed instruction manuals include fabric swatches. With 10 manuals and thus 10 sets of swatches, we can serve up to 100 students per semester. Those of you involved in Textiles recognize the tremendous savings of time and expenses in swatch preparation, without sacrificing learnings.

Evaluation is important, and evaluation of the computer use has been three-fold. 1) The ongoing costs are minimized. Students utilize an average of $5.00 computer time per semester. 2) The student grades in TCD 206 are improved over grades of the pre-CAI TCD 206 students and 3) Students report a positive attitude toward the computer and the CAI lessons. Students comment that the lessons are most helpful in preparing them for examinations; and several students have commented that they would like more CAI lessons, especially covering fiber properties. Based on this evidence we have positive reinforcement for continuation of Computer-Assisted Programmed Instruction in Textiles.